Riccardo Zamboni

info
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About Me

I am a curious and enthusiast engineer. I am passionate about cooperative autonomous agents and collaborative intelligence and how to use them. I believe in technology's potential to lead to ethical innovations, and I am looking to ways towards them.

Experiences

2022.05 – 2022.01 **Research Scholar**
Polytechnic University of Milan (Milan, Italy)
- Artificial Intelligence and Robotics Laboratory
- Research Topics: Reinforcement Learning
- Advisor: M. Restelli

2021.12 – 2021.10 **Embedded Software Developer**
Kalpa S.r.l. (Milan, Italy)
- Development projects in Embedded Software Architectures
- Focus: Embedded Software and Machine Learning

2021.10 – 2019.11 **Automation & Control Research Engineer**
e-Novia S.p.A. (Milan, Italy)
- Innovation projects by driving development for Proof of Concepts and Minimum Viable Products in scalable algorithms based on state-of-the-art control and machine learning techniques
- Focus: Dynamic Pricing, AgriTech, Intelligent Control, Embedded Software

2019.08 – 2018.09 **Visiting Researcher**
Tohoku University (Sendai, Japan)
- Neuro-Robotics Laboratory
- Focus: Motor Control, Neuroscience, Bio-inspired Learning
- Research Topic: Bio-inspired control towards embodied intelligence
- Advisors: Mitsuhiro H., Owaki D.

Side Experiences

Ongoing – 2022.03 **Advisory Board Member**
JEMP (Milan, Italy)
- Advisory activities about the strategic development of the association in the long-term trajectory

2018.09 – 2017.10 **Junior Consultant**
JEMP (Milan, Italy)
- Management and design consulting projects in a dynamic, competitive and entrepreneurial oriented student association

Education

Ongoing – 2022.06 **Ph.D. in Information Technology**
Polytechnic University of Milan (Milan, Italy)
- Research Topics: Cooperative Multi-Agent Reinforcement Learning, Industry 4.0
- Advisor: M. Restelli
- Industrial Partner: Siemens (AT)

2019.10 – 2017.09 **M.Sc. in Automation and Control Engineering**
Polytechnic University of Milan (Milan, Italy)
- Focus: Data Analysis, Model Estimation, Advanced and Adaptive Control, Advanced Optimization, Motor Control
- Final Grade: 110/110 Cum Laude, Avarage of grades: 30/30
- Grants: Roberto Rocca Scholarship 2019 (Top 1% students)

2017.07 – 2014.09 **B.Sc. in Mechatronics Engineering**
University of Trento (Trento, Italy)
- Focus: Control Theory, Calculus, Algebra, Advanced Algorithms, Mechanical and Electronic Design, Electrical Systems
- Final Grade: 110/110 Cum Laude
- Grants: Student Merit Award 2017

Publications

1) "Adaptive and Energy-efficient Optimal Control in CPGs through Tegotae-based Feedback", R. Zamboni, D. Owaki and M. Hayashibe, Frontiers in Robotics and AI, section Computational Intelligence in Robotics (2021)
2) "Energy Efficiency Analysis of the Tegotae Approach for Bio-inspired Hopping", R. Zamboni, D. Owaki and M. Hayashibe, Proc. of 9th International Symposium on Adaptive Motion of Animals and Mechanics, EPFL, Lausanne, (2019)

Programming Languages

(Proficient) Python, MATLAB, MATLAB SIMULINK and C-Coder
(Advanced) C++
(Basic) (Postgre)SQL

Natural Languages

(Native) Italian
(Fluent, IELTS 7.5) English
(Basic) Japanese

Coding & Algorithms

Signals and Time-series: DWT, RNN, GPs
Optimal Control: Multiple Shooting, LQR, MPC
Dimensionality Reduction: PCA, (R)ICA
Clustering: K-Means, K-Prototypes
Dynamics Analysis: Lyapunov Exponents
Bayesian Inference: (E)KF, Bayesian Optimization
Reinforcement Learning: Q-Learning, Dyna-Q, AC
ML Libraries: Pytorch, TensorFlow, scikit-learn

Research Interests

- Multi-agent Reinforcement Learning
- Cooperative Intelligence
- Control Theory and Reinforcement Learning Nexus